Notebook, N-99-10-00

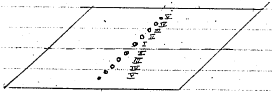
N-(99-10-00)

Results of

Cement-experiments. (903)

I

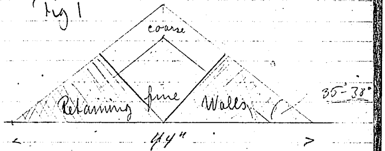
In a table of 48" Diameter for a cone of 44" there are cut holes 4" apart so, that when running out the cone all holes run empty at the same time


V
IV
III
II
I
I
II
III
IV
V

Diameter of holes	I	3/4"
"	II	11/16"
	III	19/32"
	IV	1/2"
	V	5/16

II

Fig 1


coarse
fine
Retaining
Walls
35-38°
44"

Material for the experiments.

coarse: on 29/1000 screen
and through 50/1000 "

fine on 9/1000 screen
through 23/1000 "

The samples are separated on 23/1000 Handscreen.

The amount of stuff run out through the mentioned 10 holes represents ca. 26 % of the hole cone.

#394

The cavity formed by running out the bags filled up with
64 lbs fine material } 128 lbs
64 " coarse "
See Fig 1
15 second samples taken

	in lbs			in percent		
	fine	coarse	total	fine	coarse	difference
1	14.250	7.250	21.500	66.35%	33.65	+ 32.70
2	6.750	13.500	20.250	33.35	66.65	- 33.30
3	7.000	13.000	20.000	35.00	65.00	- 30.00
4	10.312	10.000	20.312	50.85	49.15	+ 1.70
5	13.250	8.750	22.000	60.35	39.65	+ 20.70
Balance	13.312	6.563	19.875	67.00	33.00	+ 34.00
total	64.874	59.063	123.937			15170

Average difference in percent

$$\frac{157.70}{6} = 25.3\ \%$$

#395.

#394- reversed.

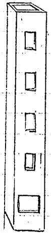
65 lbs coarse on bottom
65 " fine above

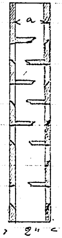
	in lbs			in percent		
	fine	coarse	total	fine	coarse	difference
1	4.250	13.435	17.685	24.10	75.90	51.80
2	9.813	9.125	18.938	51.80	48.20	3.60
3	17.250	5.062	22.312	77.35	22.65	54.70
4	13.150	7.250	20.400	64.50	35.50	29.00
5	8.312	10.781	19.093	43.60	56.40	12.80
Balance	10.187	21.125	31.312	32.58	67.42	34.84
total	62.962	66.778	129.740			186.74

Average difference in percent

$$\frac{186.74}{6} = 31.12\%$$

#385.





The inner diameter
a - of the pipe
is twice the diameter
of the [illegible] hole.
½ × 1", 3"
apart. Lower one
1" × ½

398

Arrangement # 385
60 lbs fine on bottom
60 " coarse " above

	fine	coarse	total	fine	coarse	difference
	in lbs			in percent		
1 (15 sec)	8.000	10.435	18.435	43.40 %	56.60	13.20
2	9.094	12.906	22.000	43.35	56.65	13.30
3	9.447	10.562	20.006	47.20	52.80	5.60
4	12.375	8.687	21.062	58.8	41.20	17.60
5	13.250	7.875	21.125	62.8	37.20	25.60
Balance	10.500	8.711	19.211	54.7	45.30	9.40
Total	62.663	59.176	121.839			84.70

Average difference

$$\frac{84.70}{6} = 14.11\%$$

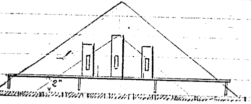
#399

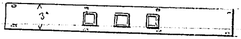
#393 reversed.
60 lbs coarse under
" " fine above

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	13.187	7.500	20.687	63.80	36.20	27.60
2	14.625	7.063	21.688	67.60	32.40	37.20
3	10.625	10.500	21.125	50.40	4960	0.80
4	7.435	12.250	19.675	37.80	62.20	24.40
5	5.687	10812	16.499	34.50	65.50	31.00
Balance	7.250	8.562	15.812	45.80	54.20	8.40
total	58.809	56.687	115.486			129.40

Average difference
$\frac{129.4}{6} = 21.57\%$

#4 17.





a platform 3" broad running over the holes 2" over the table. – 3 pipes in the middle.

Bottomholes as described in I

#420

Arrangement #417
64 lbs fine below
64 ~ coarse above

	in lbs			in percent		
	fine	coarse	total	fine	coarse	difference
1 (15 sec).	11.500	9.843	21.343	54.00 %	46.00 %	8.00 %
2	9.187	11.563	20.750	46.75	53.25	6.50
3	10.031	10.687	20.718	48.40	51.60	3.20
4	8.710	12.406	21.116	41.10	58.90	17.80
5	9.593	9.937	19.530	49.20	50.80	1.60
Balance	11.875	8.436	20.311	58.20	41.80	16.40
	60.896	62.872	123.768			53.50

Average difference

$\frac{53.5}{6} = \underline{\underline{8.91\ \%}}$

#425

Pipes described in #385 changed as follows

Baffles in four middle pipes closing 3/4 of the opening
Two wide holes on four middle pipes.
Holes on one side only.

#426
Pypes in #425
65 lbs fine below
65 " coarse on top

	in lbs			in percent		
	fine	coarse	total	fine	coarse	difference
1 (15 sec)	10.000	10.625	20.625	48.40	57.60	3.20
2	6.250	12.406	18.656	33.50	66.50	33.00
3	9.063	11.187	20.250	44.80	55.20	10.40
4	9.625	10.562	20.187	47.80	52.20	- 4.40
5	11.406	8.593	19.999	57.20	42.80	14.40
Balance	16.187	10.063	26.250	61.70	38.30	23.40
total	62.531	63.436	125.967			78.80

Average difference =

$\frac{78.8}{6} = 13.13$

#427 Pipes from #425 -

a) 32 lbs fine, b) 32 lbs coarse
c) 32 " fine, d) 32 " coarse

		fine	coarse	total	fine	coarse	difference
(15 sec)	1	9.906	10.250	20.156	49.20	50.80	1.60.
	2	8.531	11.094	19.625	43.45	56.55	13.10
	3	9.000	11.406	20.406	44.20	55.80	11.60
	4	10.532	10.218	20.750	50.80	49.20	1.60
	5	11.593	9.281	20.874	55.50	44.50	11.00
Balance		11.250	8.250	19.500	57.70	42.30	15.30
Total		60.812	60.499	121.311			54.20

Average difference

$\frac{54.20}{6} = 9,03$

#447.

Pipes cut down to take stuff from the tops during the two first runs

Large holes on both sides of 4 middle pipes

Holes no 2 from bottom on the two middle pipes : $1\frac{1}{2} \times \frac{1}{4}$"

#448.

	Outside 6 holes			Inside 4 holes		
	fine	coarse	total	fine	coarse	total
1	2.187	4.063	6.250	10.125	3.938	14.063
2	2.125	4.875	7.000	10.875	3.812	14.687
3.	0.750	4.937	5.687	7.750	6.250	14.000
4	1.000	4.872	5.812	6.906	7.000	13.906
5	1.937	3.906	4.843	7.969	5.625	13.594
Balance	4.218	4.969	9.187	12.031	6.750	18.780
Total	12.217	27.562	49.779	55.656	33.375	89.031

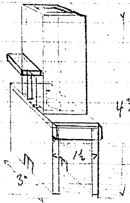
#448 Pipe #447
65 lbs fine below
65 " coarse above

	in lbs			in percent		
	fine	coarse	total	fine	coarse	total
1	12.312	8.000	20.313	61.00	39.00	22.0
2	13.000	8.687	21.887	60.00	40.00	20.0
3	8.500	11.187	19.687	43.20	56.80	13.6
4	7.906	11.872	19.718	40.00	60.00	20.0
5	9.906	9.531	19.437	50.90	49.10	1.8
Balance	16.249	11.719	27.968	58.30	41.70	16.6
total	67.873	60.937	128.810			94.0

Average difference

$\frac{94}{6} = \underline{15.7}$ %

#462



Four pipes for the four middle holes

Buttonholes as described in # I.

#462

	Outside 6 holes			Inside 4 holes		
	fine	coarse	total	fine	coarse	total
1 (15 sec)	2.875	5.000	7.875	6.156	6.125	12.281
2	1.094	6.094	7.188	7.562	3.375	10.937
3	0.843	5.466	6.309	6.937	1.843	8.780
4	0.718	5.032	5.750	4.718	4.250	8.968
5	1.656	4.250	5.906	4.375	4.213	8.593
6	2.562	3.312	5.874	4.250	3.187	7.437
7	1.435	0.937	2.372	4.812	1.593	6.405
Balance	0.781	1.187	1.968	10.969	3.812	14.781
Total	11.964	31.278	43.242	49.779	28.403	78.182

#462

Arrangement #462
60 lbs fine on bottom
60 " coarse above.

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1 (15 sec	9.031	11.125	20.156	44.9%	55.1	10.2
2	8.656	9.469	18.125	46.6	53.4	6.8
3	7.780	7.369	15.089	51.6	48.4	3.2
4	5.436	9.282	14.718	36.9	63.1	26.2
5	6.031	8.468	14.499	41.7	58.3	16.6
6	6.812	6.499	13.311	51.2	48.8	2.4
7	6.247	2.530	8.777	71.2	28.8	42.4
Balance	11.750	4.999	16.749	70.0	30.0	40.0
Total	61.743	59.681	121.424			147.8

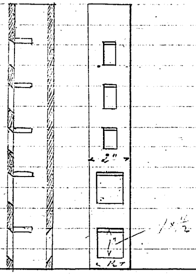
Average difference

$\frac{147}{8} = 18.37\ \%$

#468

Pipes. #385 changed as follows. 2 lower holes on front and one hole opposit the lower front hole. on backside

Baffles closing half inner opening



#468

	Outside 6 holes.			Inside 4 holes		
	fine	coarse	total	fine	coarse	total
1 (15 sec)	4.063	5.063	9.126	4.094	5.531	9.625
2	1.312	5.125	6.437	6.562	6.656	13.218
3	0.875	5.625	6.500	10.500	4.969	15.469
4	2.469.	4.156	6.625	10.500	4.312	14.812.
5	3.063	3.719	6.782	11.000	4.656	15.656
Balance	6.375	6.125	12.500	4.218.	1.156	5.374
total	18.157	29.813	47.970	46.874	27.280	74.154

#468.

61 lbs fine below
61 " coarse on top

	in lbs.			in %		
	fine	coarse	total	fine	coarse	difference
1	8.157	10.594	18.751	43.5 %	56.5 %	13.0 %
2	7.874	11.781	19.655	40.0	60.0	20.0
3	11.375	10.594	21.969	57.9	47.1	3.8
4	12.969	8.468	21.437	60.5	39.5	21.0
5	14.063	8.375	22.438	62.7	37.3	25.4
Balance	10.593	7.281	17.874	59.3	40.7	18.6
total	65.031	57.093	122.124			101.8

Average difference

$$\frac{101.8}{6} = 16.97\,\%$$

569.

Cone of 44" diameter.
The angle of the sides 36°
Height of cone 16"
Volume of cone 11120 □"
Weight of cone 610 lbs.

The middle of cone run
out through 2. 4. 6, 8 & 10
5/16 holes 4" apart symetrical to
centre:

570 - 574

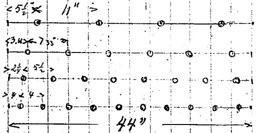
	Amount of stuff run out	Amount of stuff run out in % of bole cane
2 holes	105 lbs	18 %
4 "	128 "	21.1 %
6 "	139 "	22.8 %
8 "	146 "	23.95 %
10 "	149 "	24.55 %

Amount run out through 2 holes is 74 % of
the amount - - - 10 holes.

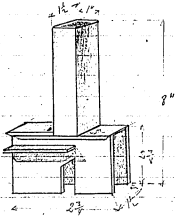
*575
Same cane as #569.
Middle run cut through
4 holes 11" apart
6 " 7.33" "
8 " 5½" "
10 " 4.4" "

Exp 576 - 478.

	Amount of stuff min cut	Amount of [illegible] in min bit in percent of hole cone
4 holes	119.5 lbs	19.5 %
6 "	129.5 "	21.25 %
8 "	137.0 "	22.45 %
10 "	149 "	24.85 %



#579



Pipes over two 5/16" holes 2" from centre

In following experiments the samples are taken out by weight each ca 10 lbs.

#585
Pipe #579
50 lbs fine under
50 " coarse above

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	3.625	6.469	10.094	35.8%	64.2%	-28.4%
2	3.936	6.218	10.154	38.7	61.3	-22.6
3	5.281	5.031	10.312	57.2	48.8	+2.4
4	5.094	4.937	10.031	50.7	49.3	+1.4
5	5.469	4.781	10.250	53.3	46.7	+6.6
6	5.349	4.687	10.031	53.1	46.9	+6.2
7	5.812	4.250	10.062	57.7	42.3	+15.4
8	5.675	4.312	9.987	56.9	43.1	+13.8
9	5.812	4.469	10.281	58.1	41.9	+16.2
10	4.375	5.718	9.093	37.1	62.9	-25.8
total						138.8

Average difference : $\frac{138.8}{10} = 13.88\%$

#592

#585 reversed
50 lbs coarse under
50 - fine above

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	7.187	2.500	9.687	74.3%	25.7%	-48.6%
2	4.281	5.718	9.999	42.8	57.2	+14.4
3	6.875	3.406	10.281	66.9	33.1	-33.8
4	5.063	5.187	10.250	49.4	50.6	+1.2
5	4.563	5.500	10.063	45.3	54.7	+9.4
6	4.094	5.875	9.969	41.0	59.0	+18.0
7	4.343	5.625	9.968	43.5	56.5	+13.0
8	4.031	6.157	10.188	39.6	60.4	+20.8
9	4.063	5.687	9.750	41.7	58.3	+16.6
10						
total	44.500	45.655	90.155			175.8

Average difference $\frac{175.8}{9} = \underline{19.53}\%$

625.

Mixer # 579. Baffles removed
Sidebolts and Pipes moved further
to the left.

50 lbs coarse
50 . fine.

	in lbs			in %		
/	fine	coarse	total	fine	coarse	difference
1	6.031	3.937	9.968	60.4 %	39.6 %	20.8 %
2	4.906	5.031	9.937	49.4	50.6	1.2
3	6.687	3.437	10.124	66.0	34.0	32.0
4	5.250	4.938	10.188	51.6	48.4	3.2
5	5.000	5.000	10.000	50.0	50.0	0.0
6	5.125	4.937	10.062	50.9	49.1	1.8
7.	4.812	5.375	10.187	47.1	52.9	5.8
8	3.906	6.156	10.062	38.7	61.3	22.6
9	3.593	6.312	9.905	36.2	63.8	27.6
10	4.313	5.906	10.219	42.2	57.8	15.6
total	49.623	49.128	98.651			130.6

Average difference = 13.06 %.

#626
#625 reversed
50 lbs fine under
50 - coarse above

	in lbs			in %		
	fine	coarse	total	fine	coarse	diff
1	5.125	5.063	10.188	50.4	49.6	0.8
2	4.188	5.750	9.938	42.1	57.9	15.8
3	5.063	5.031	10.094	50.2	49.8	0.4
4	4.406	5.594	10.000	44.1	55.9	11.8
5	4.343	5.750	10.093	42.9	57.1	14.2
6	4.594	5.468	10.062	45.7	54.3	8.6
7	5.250	4.906	10.156	51.8	48.2	3.6
8	5.531	4.594	10.125	54.6	45.4	9.2
9	5.750	4.468	10.218	56.3	43.7	12.6
10	5.687	4.344	10.031	56.6	43.4	13.2
total	49.937	50.968	100.905			90.2

Average difference 9.02 %

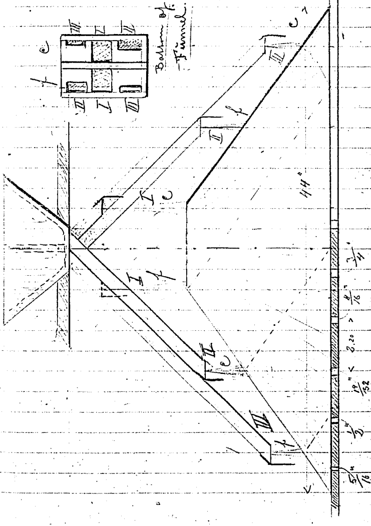
#596

The coarse and fine stuff is filled into separate funnels and runs through chutes to 6 points, lying in one diameter of the cone 2.20" apart here building coarse and fine piles vice versa.

The feed of each chute is by means of different sizes of holes regulated so that all chutes together fill up the cavity of a cone of 44" Dia.

The samples are taken through the holes described in # I

596

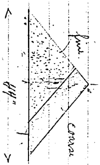

Bottom of Funnel
III
II
III
c
f
II
I
III
c
f
III
II
I
c
I
f
II
c
III
f
44"
3/4"
4/16"
2.20
19/32"
1/2"
5/16"

#597
Cone built through chutes
from #596.
70 lbs fine under
70 - coarse above

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	8.125	2.063	10.188	80.0%	20.0%	+60.0%
2	5.750	4.157	9.907	58.0	42.0	+16.0
3	4.000	6.125	10.125	39.5	60.5	-21.0
4	3.437	6.437	9.874	34.9	65.1	-30.2
5	3.437	6.625	10.062	34.0	66.0	-32.0
6	3.376	7.687	11.063	30.5	69.5	-39.0
7	4.031	6.125	10.156	39.7	60.3	-20.6
8	4.313	5.687	10.000	43.1	56.9	-13.8
9	4.782	5.343	10.125	47.3	52.7	-5.4
10	5.250	4.782	10.032	52.3	47.7	+4.6
11	5.625	4.625	10.250	54.9	45.1	+9.8
12	6.125	4.375	10.500	58.4	41.6	+16.8
13	4.500	5.687	10.187	44.1	55.9	-11.8
14	4.343	5.875	10.218	42.5	57.5	-15.0
Total	67.094	75.593	142.687			296.0

Average difference $\frac{296.0}{14} = 21.15\%$

#602

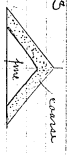


70 lbs fine
70 ~ coarse

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	7.438	2.531	9.969	75.0%	25.0%	50.0%
2	5.906	4.469	10.375	57.0	43.0	14.0
3	7.000	6.094	13.094	53.5	46.5	7.0
4	5.156	7.187	12.343	41.6	58.3	16.6
5	4.343	5.625	9.968	43.6	56.4	12.8
6	3.937	5.688	9.624	40.9	59.1	18.2
7	4.750	5.782	10.532	45.1	54.9	9.8
8	4.688	5.156	9.844	47.6	52.4	4.8
9	4.625	5.375	10.000	46.3	53.7	7.4
10	5.563	4.750	10.313	53.8	46.2	7.6
11	5.500	4.375	9.875	55.6	44.4	11.2
12	5.219	4.343	9.562	54.5	45.5	9.0
13	3.938	5.750	9.688	40.5	59.5	19.0
14						
total	68063	67725	135188			1874

Average difference $\frac{187}{13} = 14.4\%$

#603



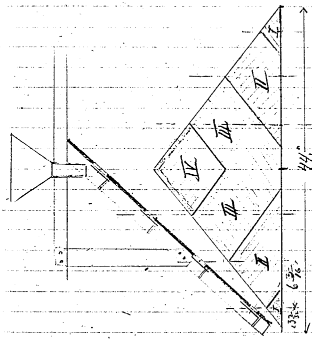
70 lbs fine
70 " coarse

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	8.500	1.750	10.250	82.8%	17.2%	65.6 %
2	6.063	3.812	9.875	61.5	38.5	23.0
3	5.250	4.875	10.125	51.8	48.2	3.6
4	3.469	6.438	9.907	35.0	65.0	30.0
5	2.656	7.469	10.125	26.2	73.8	47.6
6	3.031	6.594	9.625	31.5	68.5	37.0
7	3.781	6.594	9.375	29.7	70.3	40.6
8	4.875	5.250	10.125	48.2	51.8	3.6
9	5.250	4.937	10.187	51.6	48.4	3.2
10	5.063	5.125	10.188	49.6	50.4	0.8
11	6.187	3.812	9.999	61.9	39.1	23.8
12	5.531	4.187	9.718	56.8	43.2	13.6
13	5.969	5.875	11.844	50.4	49.6	0.8
14	4.063	3.750	7.813	51.9	48.1	3.8
total	69.688	70.468	140.156			297.0

Average difference = $\frac{297}{14}$ = 21.2 %

633.

Samples taken out through the holes described in # I



I
II
III
IV
III
II
I
44"
6 3/16"
3 3/32"

#634

Arrangement #633

Canes I 3 lbs coarse each
II 14 " fine "
III 30 " coarse "
IV 42 " fine under & 4 lbs coarse

	in lbs			in %		
	fine	coarse	total	fine	coarse	diff.
1	3.500	6.531	10.031	35.0	65.0	30.0
2	3.375	6.781	10.156	33.3	66.7	33.4
3	4.125	6.031	10.156	40.6	59.4	18.8
4	4.875	5.000	9.875	49.4	50.6	1.2
5	5.469	4.531	10.000	54.7	45.3	9.4
6	5.969	3.875	10.844	643	35.7	28.6
7	5.563	4.437	10.000	55.6	44.4	11.2
8	4.437	5.687	10.124	43.9	56.1	12.2
9	4.375	5.563	9.938	45.0	55.0	10.0
10	3.937	6.000	9.937	39.6	60.4	20.8
11	4.937	5.125	10.062	49.0	51.0	2.0
12	4.250	5.750	10.000	42.5	57.5	15.0
13	4.813	5.156	9.969	48.2	51.8	3.6
14	5.031	4.875	9.906	50.7	49.3	1.4
total	64.656	75.339	139.995			197.6

Average difference : $\frac{197.6}{14} = \underline{14.1\%}$

635

#634 reversed

Cones I 3 lbs fine each
II 14 " coarse "
III 30 " fine "
IV 42 " coarse under & 9 lbs fine above

	in lbs			in %		
	fine	coarse	total	fine	coarse	difference
1	6.343	3.563	9.906	63.9	36.1	27.8
2	5.437	4.563	10.000	54.4	45.6	8.8
3	4.563	5.312	9.875	46.2	53.8	7.6
4	4.813	4.937	9.750	49.4	50.6	1.2
5	4.875	5.094	9.969	48.9	51.1	2.2
6	4.750	5.218	9.968	47.6	52.4	4.8
7	4.531	5.406	9.937	45.6	54.4	8.8
8	4.781	5.250	10.031	47.7	52.3	4.6
9	4.750	5.250	10.000	47.5	52.5	5.0
10	5.063	4.906	9.969	50.7	49.3	1.4
11	5.437	4.843	10.280	52.8	47.2	5.6
12	5.250	4.906	10.156	51.7	48.3	3.4
13	4.250	5.656	9.906	42.9	57.1	14.2
14	5.063	4.937	10.000	51.0	49.0	2.0
	69.906	69.841	139.747			97.4

Average difference = $\frac{97.4}{14}$ = 6,95

#636